Concerning Bronze

Issued by
Manhattan
Brass
Company
New York

MANHATTAN BRASS COMPANY

ESTABLISHED 1865

Nothing but Bronze and Brass

No Iron or Steel worked in any form

FIRST AVENUE, 27TH AND 28TH STREETS
NEW YORK

Foundry, Rolling Mills, and Factories Owned and Operated Exclusively by the Manhattan Brass Company, Producers of Architectural Bronze and Brass Work

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"There is a law of evolution operating everywhere, year after year and age after age. This law tends to eliminate the unessential in things. It takes away the tares from the wheat; it removes the brambles and leaves the vine; it destroys the superfluous and leaves the solid—it condenses."

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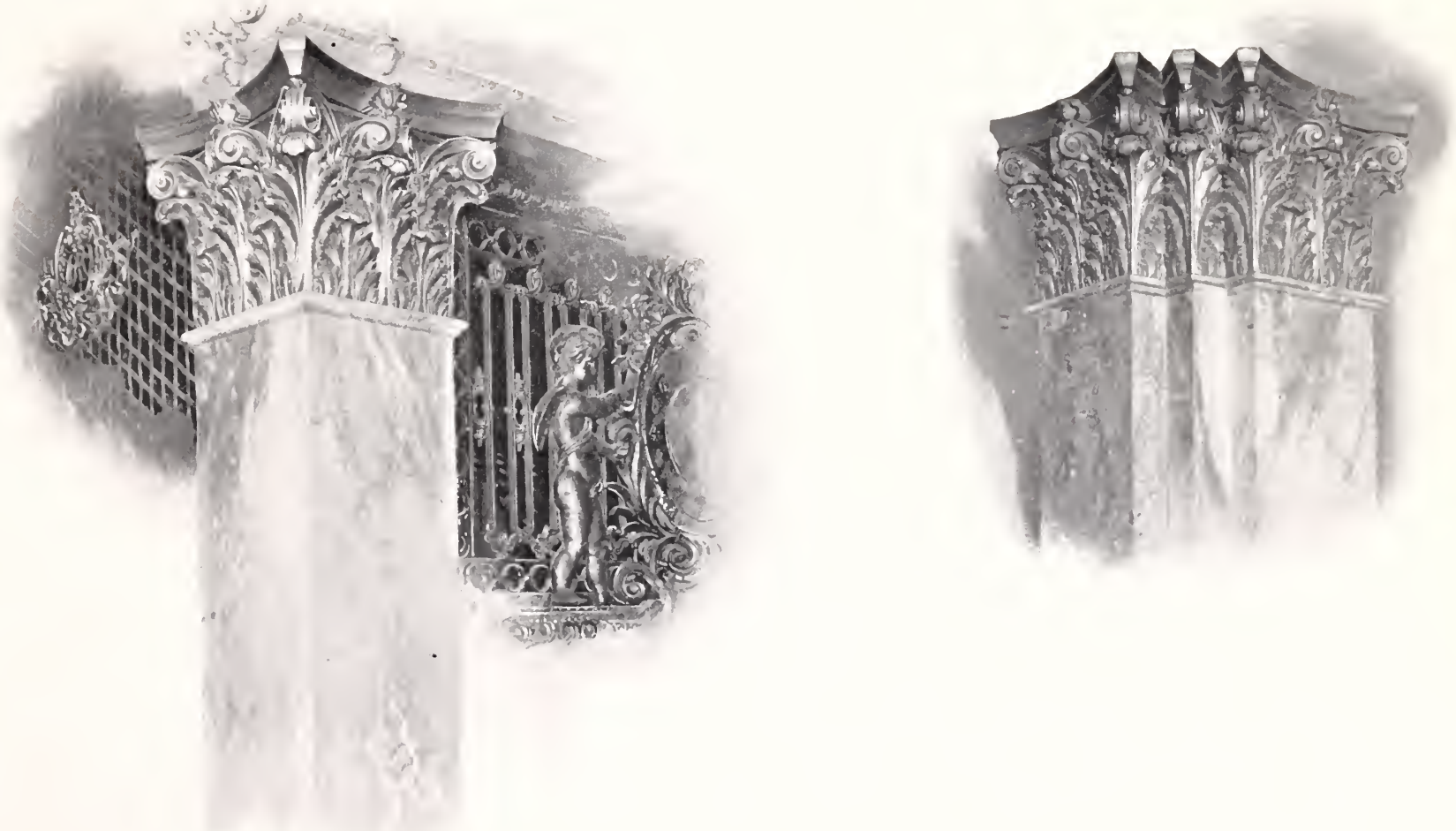
THE middleman is having a severer struggle for existence than the men either side of him. The contest is sharp enough everywhere, but the middleman is at the focus. He has served a useful purpose, and within a certain area he is a necessity, but that area is being circumscribed on both sides. If the manufacturers combine, they concentrate their selling agencies; if they remain apart, the competition between them becomes so sharp that they get into direct relations with the consumer. In either case the producer and the consumer are pushed up nearer to each other, and the man who is between the two finds his position getting tighter and tighter. With the decline in the rates of profit there is a decline in the number of profits that each transaction can sustain."—*New York Journal of Commerce.*

ALLOYS	Copper	Tin	Zinc	Lead
Statue of Louis XV. (Paris)	82.4	4.	10.3	3.2
Statue of Henry IV. (Paris)	89.6	5.7	4.2	0.5
Statue of Napoleon I. (Paris)	75.	3.	2.	2.
Column Vendome	89.2	10.2	0.5	0.1
Bacchus (Potsdam Palace)	89.4	7.5	1.63	1.
Munich Bronze	77.03	0.91	19.12	0.12
MODERN USAGE				
Statuary Bronze	90.	3.	2.	5.
Statuary Bronze	85.	6.	5.	4.
Statuary Bronze (D'Arcet formula)	78.5	2.9	17.2	1.4
Yellow Brass (common)	66⅔		33⅓	
Yellow Brass (for brazing)	75.	1.	24.	
Yellow Brass (tough for bearings)	75.	15.	10.	
Tough Brass (Thompson's formula)	55.	0.5	44.5	

The above shows that there has been no fixed rule of proportion in the alloys of bronze or brass—each period, each country (and one might almost say each manufacturer) following the formula that in the particular case seemed best adapted to attain the results desired, therefore, in treating of modern practice, no more can be done than to suggest approximate rules of proportion, as every scientific manufacturer knows that the ultimate uses of the object to be made of bronze, together with the color of finish desired, should govern the proportions of the various metals entering its composition, and to discuss these details would be beyond the scope of this booklet. This company will, however, cheerfully advise with architects and owners who contemplate the use of special bronze work and aid them in any manner within its power.

MANHATTAN BRASS COMPANY, N. Y.

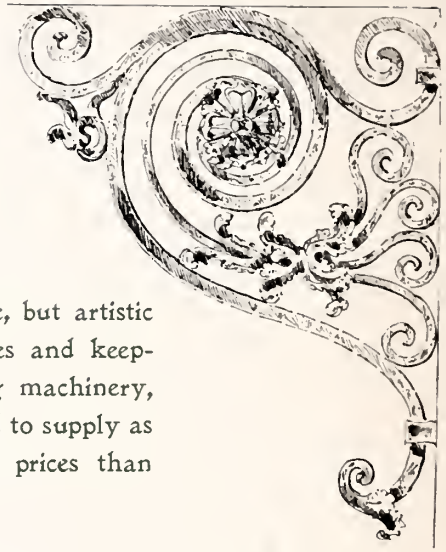


SECTION OF BRONZE ELEVATOR ENCLOSURE AND ORMOLU GOLD-PLATED BRONZE CAPITALS

Main Corridor "The Martinique," Thirty-third Street, near Broadway, New York
Mr. Henry J. Hardenburgh, Architect

MANHATTAN BRASS COMPANY. N. Y.

From the Mines to You



WE take the crude metals as they come from the mines, alloy them in our own works, *cast into decorative shapes*, or roll them into plates and draw into rods, tubes or mouldings, all in our own mills; then turn into finished products ready for use. We employ in every department the most skillful men that a liberal wage scale will obtain and turn out the best these men can produce, but artistic ability is no excuse for laziness in our factories. By watching expenses and keeping our plant equipped with the latest improvements in labor-saving machinery, at same time reaching direct "from the mines to you," we are enabled to supply as fine bronze work as is executed in this country at more favorable prices than most other concerns.

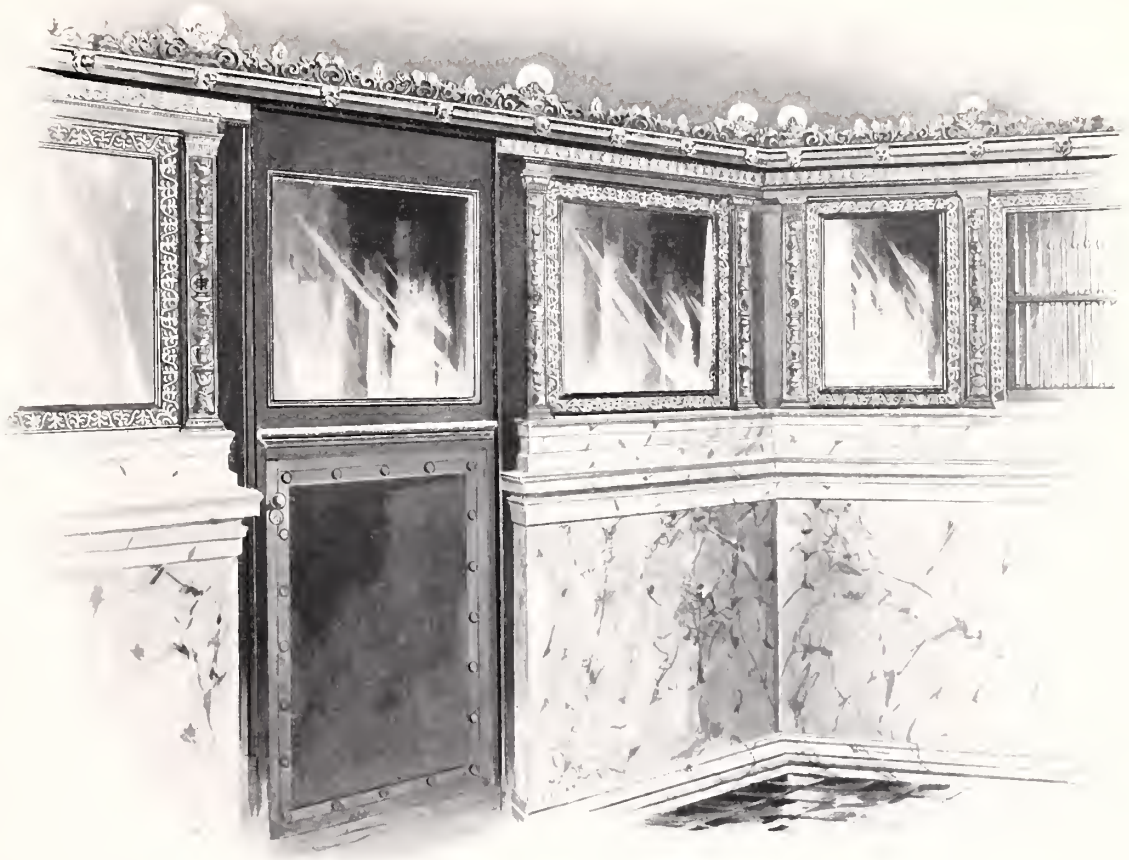
Table showing how many square inches of sheet metal are contained in one pound.
Thickness by Brown & Sharpe standard gauge.

THICKNESS	Gauge No.....	00	2	5	8	11	12	14	17	20	26
	Dec. of Inch...	.3648	.2576	.1819	.1284	.0907	.0808	.064	.0452	.0319	.0159
	Fraction Inches	3/8—	1/4+	3-16—	1/8+	3-32—	5-64—	1-16+	3-64+	1-32—	1-64+
SQUARE INCHES	Bronze...	8.78	12.5	17.6	25.	35.3	39.6	50.	70.8	100.	201.
	Brass.....	9.2	13.	18.5	26.2	37.	41.5	52.1	74.3	105.	211.

—SCANT; +FULL. **This table calculated and copyright by Manhattan Brass Co.**

RULE: To find the weight of bronze or brass plates compute square inches, multiplying length by width, then divide the product by the number of square inches contained in one pound of the thickness specified.

EXAMPLE: A sheet 1-16 in. thick (No. 14 gauge) $47\frac{1}{2}$ in. long by 10 in. wide contains 475 square inches. We find by the table above that No. 14 gauge bronze sheet requires 50 square inches to the pound, therefore we divide 475 by 50, which gives us the weight, $9\frac{1}{2}$ lbs. The entire operation being as follows: $47\frac{1}{2}$ in. x 10 in. = 475 ÷ 50 = 9.5.



SECTION OF BRONZE COUNTER RAILING—VERDÉ ANTIQUE FINISH

Main Offices, North American Trust Company, Broadway and Cedar Street, New York
Mr. Bruce Price, Architect

WE BELIEVE in competition because it is an awakener of energies and promoter of labor-saving methods. We believe in the power of price: whether the purchaser seeks a work of art or an every-day necessity, he has the same wish to obtain "his money's worth." The man or the corporation that devises the means of producing any article of utility for less cost than before, is to that extent a contributor to the public good. Competition strengthens the desire for processes that economize, and is as desirable in work essentially artistic as any other kind, it devolving on the manufacturer to employ men of proper ability and organize them so that the efforts of each man may, as far as possible, be along the line of his special qualifications.

SHRINKAGE OF CASTINGS

Proper allowances that should be made by pattern makers

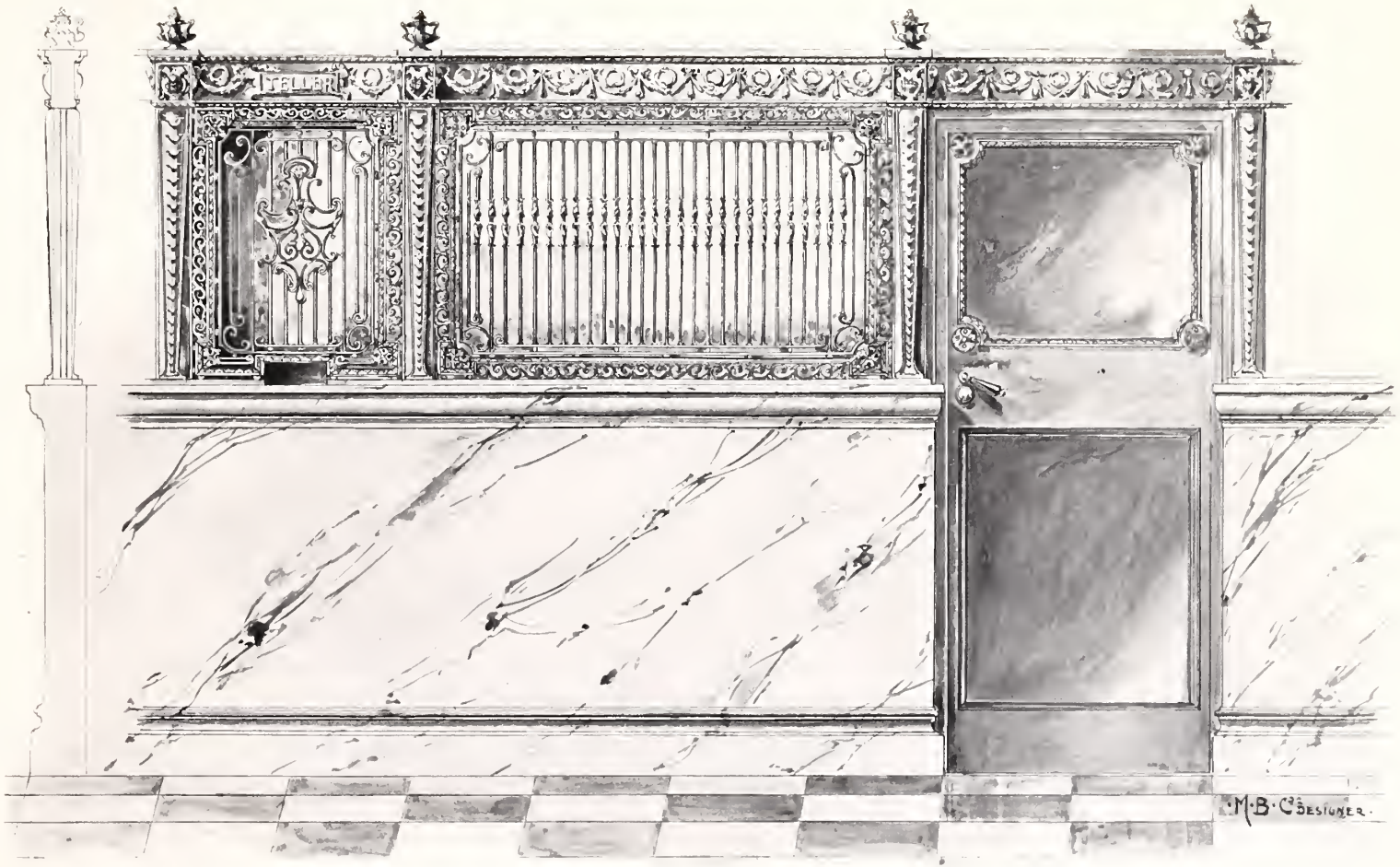
Bronze	1-75th=.0133
Thick Brass	1-80th=.0125
Thin Brass	1-72d=.0139
Copper	1-64th=.0156
Tin, pure	1-120th=.0084
Lead, "	1-64th=.0156
Zinc	1-39th=.025
Iron	1-120th=.0084

Example. *Wanted:* What is the proper length of pattern required to produce a brass casting 60 inches long? Multiply the inches by the decimal of shrinkage, thus: 60 inches x .0125=.7500 inch, which shows that the shrinkage on that length of brass casting will be .75, or ¾ of an inch, therefore the pattern must be made full 60¾ inches long in order to obtain castings of desired length. Provide for shrinkage in width and thickness in same manner as above.

TO ESTIMATE FROM PATTERNS THE WEIGHT OF CASTINGS

A pattern weighing one pound made of	Will weigh when cast in					
	Cast Iron	Zinc	Brass	Bronze	Gun Metal	Copper
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
Pine—White	16.7	16.1	19.	19.5	19.7	19.8
" Yellow	14.1	13.6	16.	16.5	16.6	16.7
Beech	9.7	9.1	10.9	11.3	11.3	11.4
Pear	10.2	9.8	11.5	11.8	12.8	11.9
Birch	10.6	10.2	11.9	12.2	12.2	12.3
Alder	12.8	12.2	14.3	14.7	14.8	14.9
Mahogany—Mexican	11.7	11.2	13.2	13.5	13.6	13.7
Maple	10.	9.8	12.	12.3	12.4	12.5
Cedar	11.5	11.4	14.	14.3	14.4	14.5
Brass	0.84	0.81	0.95	0.98	0.98	0.99

MANHATTAN BRASS COMPANY, N. Y.



FRENCH RENAISSANCE BRONZE BANKING RAILING, FLORENTINE BRONZE FINISH

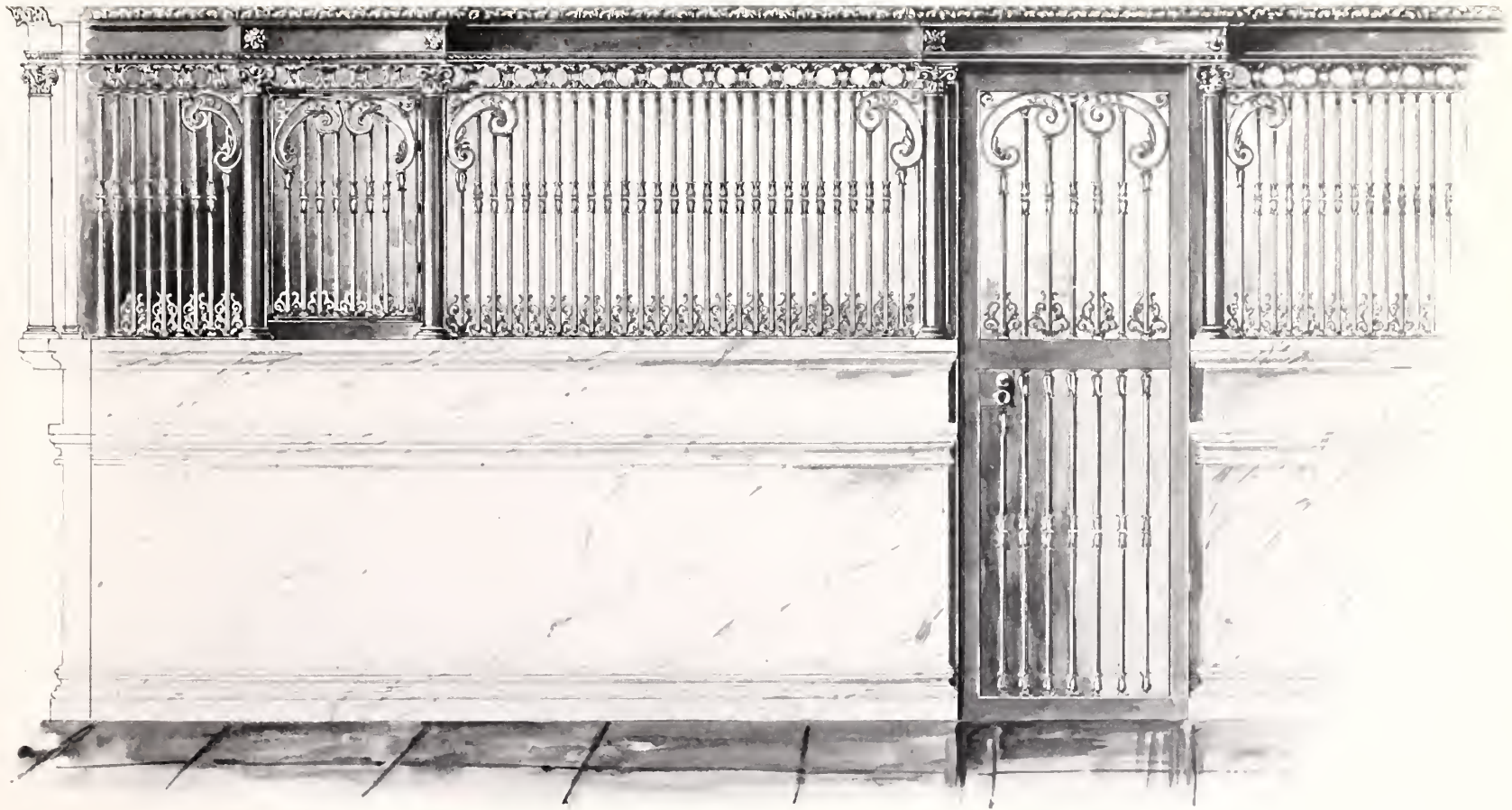
We are not Ironworkers

WHY WE EXCLUDE FROM OUR WORKS ALL METALS EXCEPT BRONZE AND BRASS

IT is illogical to handle bronze, or brass and iron in the same factory, because they are worked by opposite processes. Bronze and brass are *malleable only when cold,* iron when hot. Iron and steel we harden by sudden change of temperature from hot to cold, bronze and brass are softened by the same process. The grinding stones, emery wheels, knives, and saws that will cut one metal economically are spoiled if used on the other. You cannot use even common files made for brass on iron, or if made for iron on brass, without spoiling them. The opposite character of the metals, and necessarily opposite treatment, make it impossible for any shop to skilfully and economically work in both kinds of metals.

In concentration is strength: We have our entire plant equipped for the economical production of fine bronze and brass work. Our trade now extends to nearly all commercial centers of North and South America and parts of Europe. When you want something in this line write or phone us about it.

Sectional full-size drawings of anything illustrated in this booklet will be sent on application to architects who may be interested.



BRONZE COUNTER RAILING—GOLDEN BRONZE, SATIN FINISH

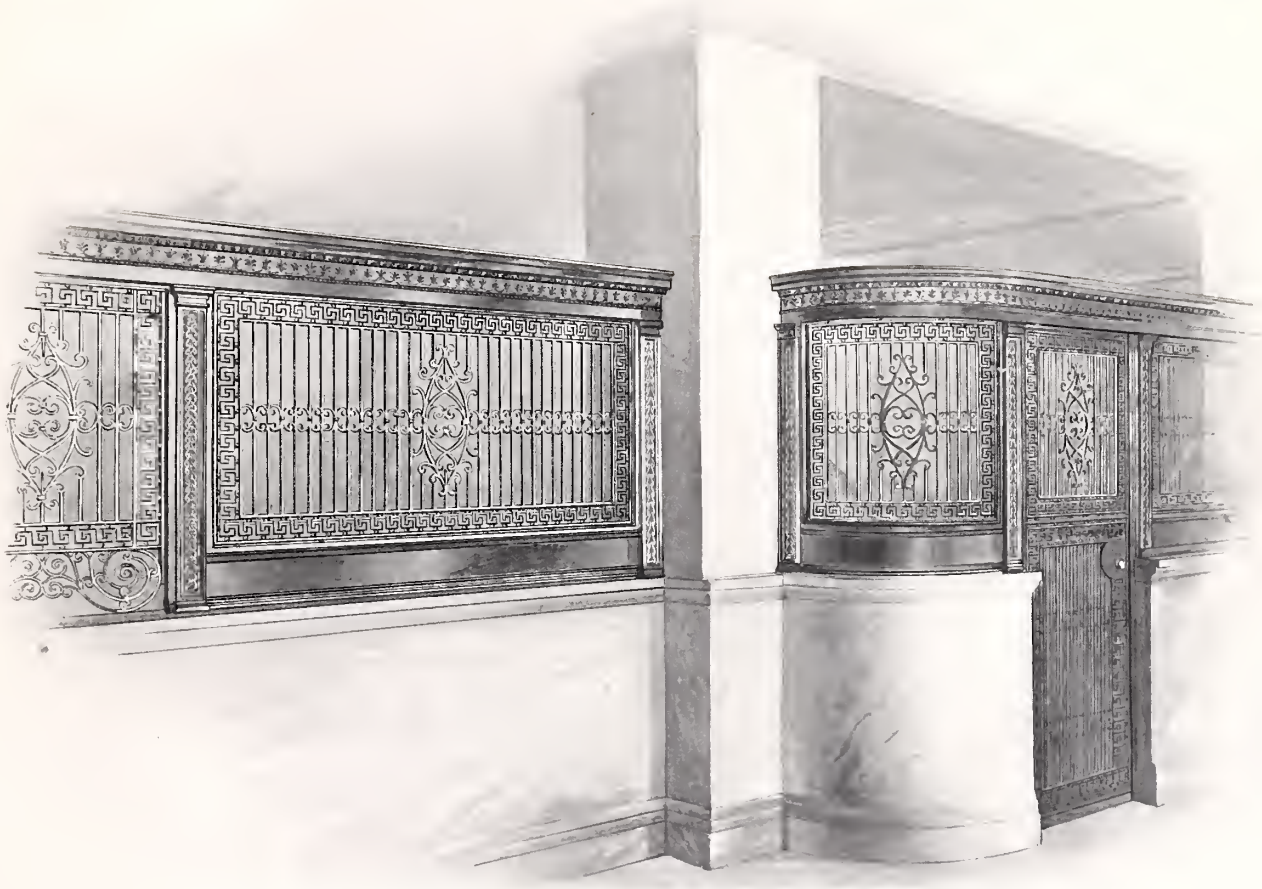
Manufactured by Manhattan Brass Company for the Havana Offices International Banking and Trust Company, Havana, Cuba

IMPERISHABLE BRONZE

"Among the many stages in the development of primeval man, none can have been of greater moment in his struggle for existence than the discovery of the metals and the means of working them. The names generally given to the three prehistoric periods of man's life on earth—the Stone, the Bronze and the Iron age—imply the vast importance of the progressive steps from the flint knife to the bronze celt, and lastly to the keen-edged elastic iron weapon or tool. The length of time during which each of these ages lasted must, of course, have been different in every country and race of the world. The Digger Indians of Southern California have even now not progressed beyond the Stone Age; while some of the tribes of Central Africa are acquainted with the use of copper and bronze, though they are unable to smelt or work iron."—*Encyclopedia Britannica.*

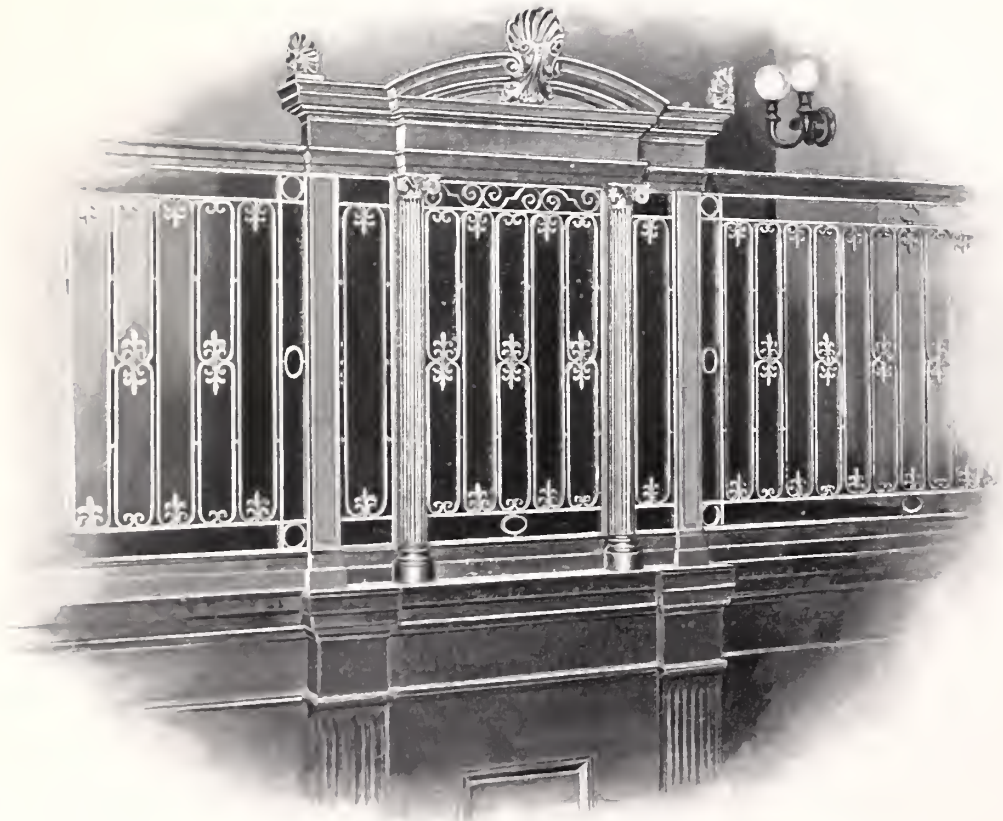
CELEBRATED artist once said: "*Heretofore I have painted my pictures in oil to crumble, hereafter I shall make them in bronze and last forever.*"

Because of its durability, there is a romance and sentiment about bronze that appeals to the imagination more strongly than other materials, for whatever is made from bronze approaches nearer to immortality than any other production of man. Gold and silver are for most artistic purposes commercially impossible by reason of great cost, besides their intrinsic value expose any object made from them to the constant peril of vandalism. Iron or steel work, however beautifully wrought, will be lost by oxidization in one generation of exposure to the elements. The pigments fade and crumble from the canvases of our greatest paintings. Sculptured marble gradually disintegrates and goes back to dust—even the ancient languages are dead—yet we have preserved to us in perfection as of yesterday old bronze weapons and utensils made by our ancestors thousands of years before Helen looked out over the battlements of Troy, and before the first Pharaoh inhabited the valley of the Nile. The development and decline of art in all ages has been marked by a corresponding fluctuation in the use of bronze, and the present revival of popular taste is no exception to that rule, as is shown by the fact that the leading architects and decorators at present are fast extending the use of this metal as an architectural enrichment, and manufacturers are now bringing the cost commercially within reach, so that every architect may commit to this imperishable material the best fruits of his genius.



BRONZE COUNTER RAILING—ANTIQUE FINISH

Main Offices of the National Surety Company, 346 Broadway, New York
From Designs by Messrs. McKim, Mead & White, Architects



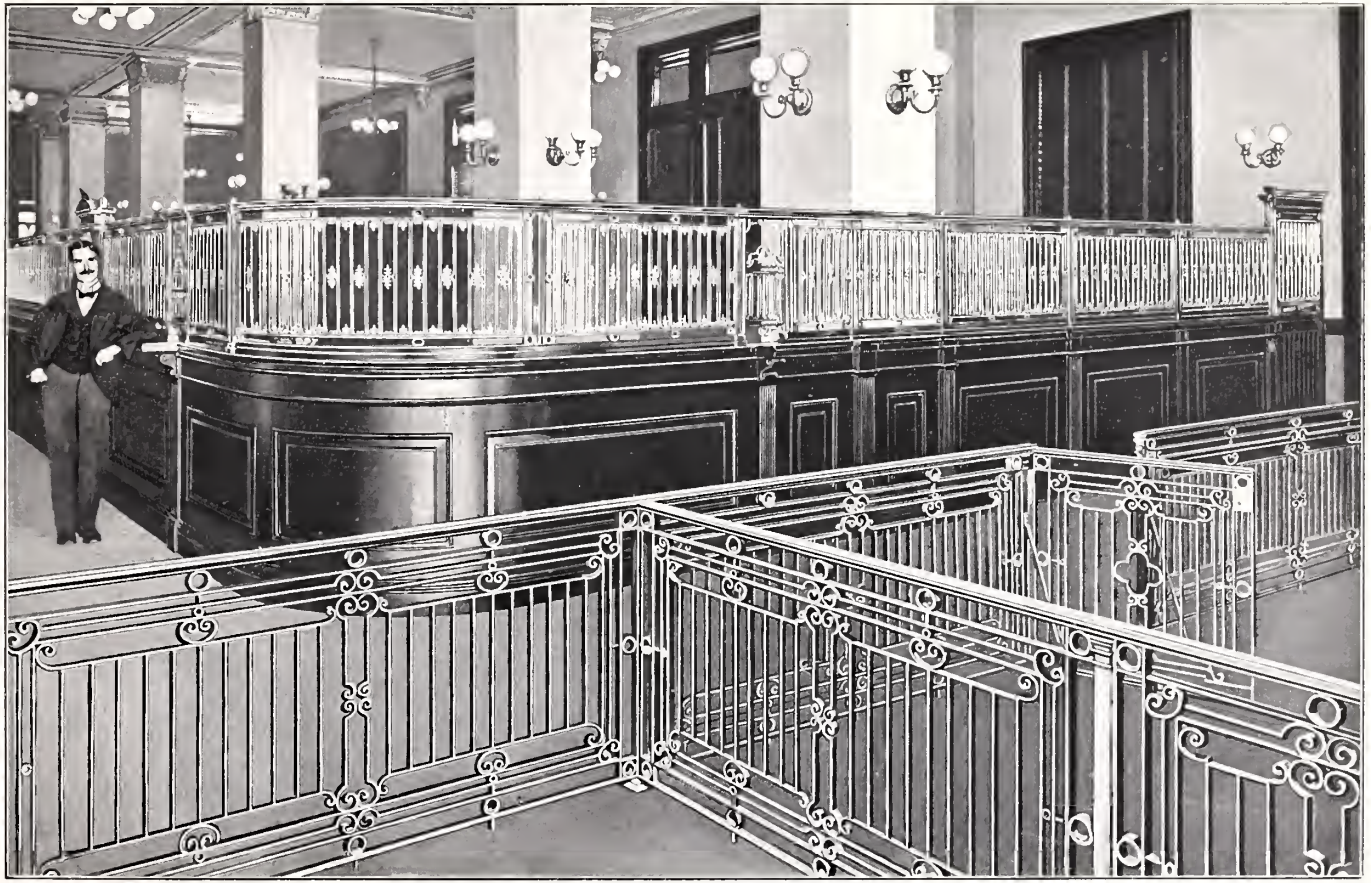
SECTION OF BRONZE COUNTER RAILING IN MAIN OFFICES
Preferred Accident Insurance Company, 290 Broadway, New York
Geo. Edward Harding & Gooch, Architects

WEIGHT OF BRASS AND BRONZE SHEETS AND PLATES

The Specific Gravities to determine the weights, and the Calculation of them, were taken and made by Charles H. Haswell, C. & M. E.

No. of Gauge	Size of each No.	Weight of Plates Square Foot		No. of Gauge	Size of each No.	Weight of Plates Square Foot	
		Brass	Bronze			Brass	Bronze
	Inch.	Lbs.	Lbs.		Inch	Lbs.	Lbs.
0000	.46000	19.688	20.672	19	.035890	1.5361	1.613
000	.40964	17.533	18.410	20	.031961	1.3679	1.436
00	.36480	15.613	16.393	21	.028462	1.2182	1.279
0	.32486	13.904	14.600	22	.025347	1.0849	1.139
1	.28930	12.382	13.000	23	.022571	.96614	1.014
2	.25763	11.027	11.578	24	.020100	.86028	0.903
3	.22942	9.8192	10.302	25	.017900	.76612	0.814
4	.20431	8.7445	9.182	26	.01594	.68223	0.716
5	.18194	7.787	8.176	27	.014195	.60755	0.638
6	.16202	6.9345	7.281	28	.012641	.54103	0.568
7	.14428	6.1752	6.484	29	.011257	.48180	0.506
8	.12849	5.4994	5.774	30	.010025	.42907	0.451
9	.11443	4.8976	5.142	31	.008928	.38212	0.401
10	.10189	4.3609	4.409	32	.007950	.34026	0.357
11	.090742	3.8838	4.078	33	.007080	.30302	0.318
12	.080808	3.4586	3.631	34	.006304	.26981	0.283
13	.071961	3.0799	3.234	35	.005614	.24028	0.252
14	.064084	2.7428	2.880	36	.005000	.2140	0.22
15	.057068	2.4425	2.564	37	.004453	.19059	0.200
16	.050820	2.1751	2.283	38	.003965	.1697	0.178
17	.045257	1.937	2.034	39	.003531	.15113	0.158
18	.040303	1.725	1.812	40	.003144	.13456	0.141

[illegible] STATE COMPANY, N. Y.



General View of Main Offices of Preferred Accident Insurance Company, 290 Broadway, New York
Messrs. Geo. Edward Harding & Gooch, Architects

MANHATTAN BRASS COMPANY, N. Y.

BRONZE GRILLES IN VESTIBULE DOORS
Residence, Fifth Avenue. Mr. Robert Maynicke, Architect

ESTIMATOR'S TABLE

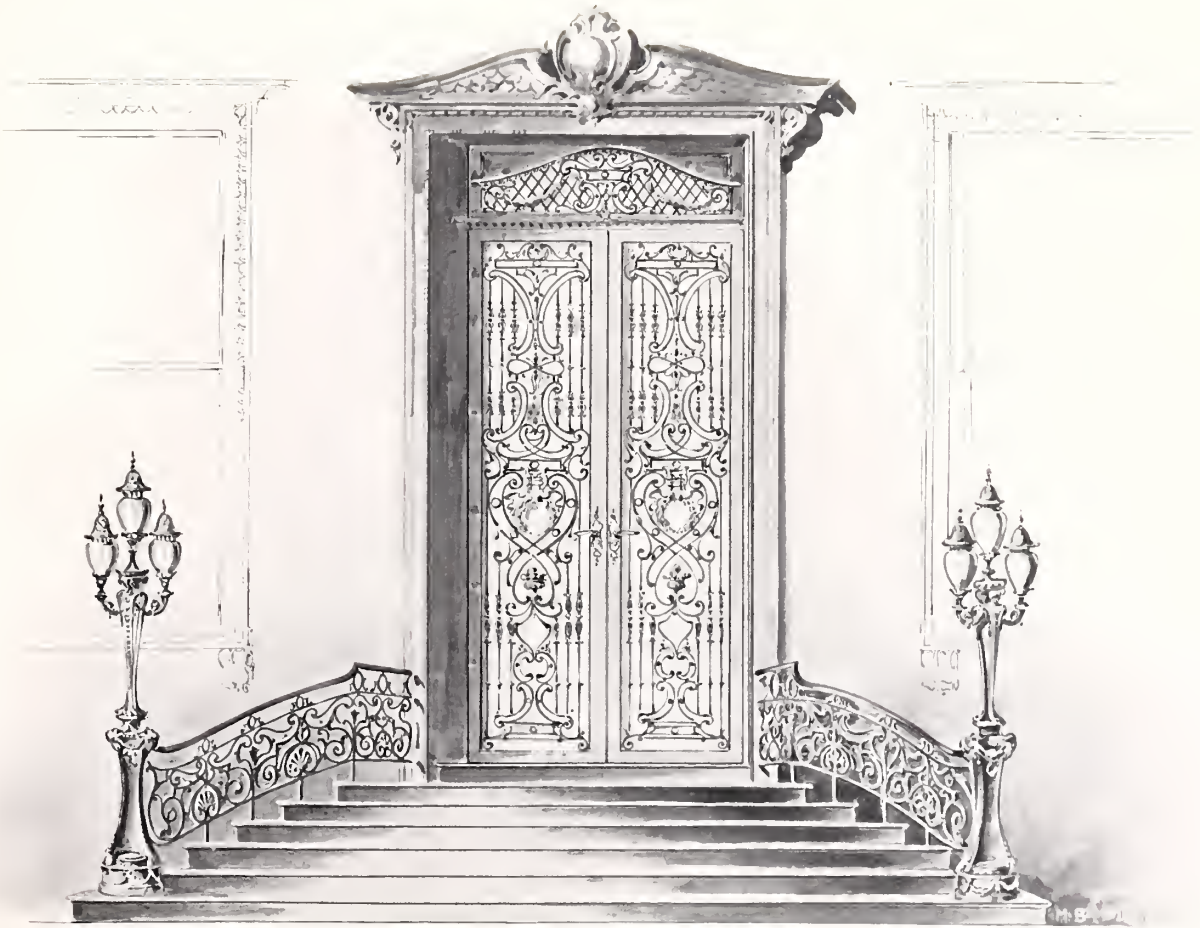
Of approximate weights of rectangular rods in decimals of a pound per lineal foot, width and thickness as indicated. These weights are theoretically correct, but variations must be expected in practice

		Thickness	Width 1/8 in.	3-16 in	1/4 in.	5-16 in	3/8 in.	1/2 in.	5/8 in.	3/4 in.	7/8 in.	1 in.	Square 12 in.
Bronze ..	.03196	*1-32 in.	.015	.023	.03	.04	.045	.06	.075	.09	.1	.12	1.44
Brass.....	No. 20		.0143	.022	.0245	.038	.043	.57	.071	.086	.096	.114	1.37
Bronze ..	.045257	3-64 in.	.021	.032	.042	.053	.064	.085	.1	.127	.15	.17	2.04
Brassi....	No. 17		.02	.03	.04	.05	.06	.08	.096	.12	.143	.162	1.94
Bronze ..	.064084	1-16 in.	.03	.045	.06	.075	.09	.12	.15	.18	.21	.24	2.88
Brass	No. 14		.029	.043	.058	.071	.085	.114	.143	.172	.2	.23	2.75
Bronze...	.080808	5-64 in.	.038	.057	.076	.095	.115	.152	.19	.228	.266	.303	3.63
Brass	No. 12		.036	.054	.072	.09	.11	.144	.18	.216	.253	.29	3.46
Bronze...	.090742	3-32 in.	.043	.064	.085	.11	.13	.17	.21	.255	.3	.34	4.08
Brass	No. 11		.04	.06	.08	.1	.12	.16	.2	.24	.287	.32	3.89
Bronze...	.12849	1/8 in.	.06	.09	.12	15	.18	.24	.3	.36	.42	.48	5.77
Brass	No. 8		.0573	.08	.115	.143	.172	.229	.287	.344	.4	.46	5.05
Bronze...	.18194	3-16 in.	.085	.128	.17	.215	.255	.34	.425	.51	.595	.682	8.18
Brass	No. 5		.082	.122	.163	.203	.244	.325	.41	.49	.57	.66	7.79
Bronze...	.25763	1/4 in.	.12	.18	.24	.3	.36	.48	.6	.72	.84	.96	11.58
Brass	No. 2		.115	.17	.128	.286	.344	.46	.575	.687	.8	.92	11.
Bronze...	Exact thickness by B. and S. standard American Gauge, and in thousandths of an inch	5-16 in.	.145	.218	.29	.365	.435	.58	.725	.876	1.02	1.16	14.
Brass			.142	.204	.276	.35	.425	.57	.715	.858	1.	1.13	13 7
Bronze...		3/8 in.	.176	.264	.352	.439	.528	.7	.88	1.06	1.23	1.41	16.9
Brass			.17	.255	.34	.42	.51	.68	.85	1.	1.2	1.36	16.4
Bronze...		1/2 in.	.234	.351	.468	.59	.7	.936	1.20	1.4	1.63	1.87	22.5
Brass			.229	.345	.4	.57	.67	.92	1.15	1.36	1.55	1.83	21.9
Bronze...		5/8 in.	.295	.442	.59	.74	.885	1.18	1.47	1.77	2.07	2.36	28.1
Brass			.285	.427	.57	.71	.855	1.14	1.43	1.7	2.	2.3	27.3
Bronze...		3/4 in.	.352	.528	.704	.88	1.06	1.41	1.77	2.11	2.46	2.81	33.8
Brass			.342	.503	.68	85	1.	1.37	1 70	2.	2.4	2.75	32.8
Bronze...		7/8 in.	.41	.61	.82	.102	1.23	1.64	2.05	2.46	2.87	3.28	41.
Brass			.4	.59	.78	.97	1.15	1.55	2.	2.4	2.8	3.2	38.3
Bronze...		1 in.	.47	.70	.94	1.15	1.4	1.88	2.35	2.82	3 29	3.76	45.
Brass			.45	.67	.9	1.1	1.3	1.82	2.3	2.75	3.2	3.64	43.7
Round Rods.....		Bronze	.046	.104	.186	.290	.417	.742	1.159	1.669	2.27	2.97	
		Brass..	.044	.100	.176	.275	.395	.707	1.104	1.590	2.17	2.83	

* Approximate thickness in fractions of an inch.

This table calculated and copyright by Manhattan Brass Company.

MANHATTAN BRASS COMPANY, N. Y.



ENTRANCE TO RESIDENCE, NEW YORK

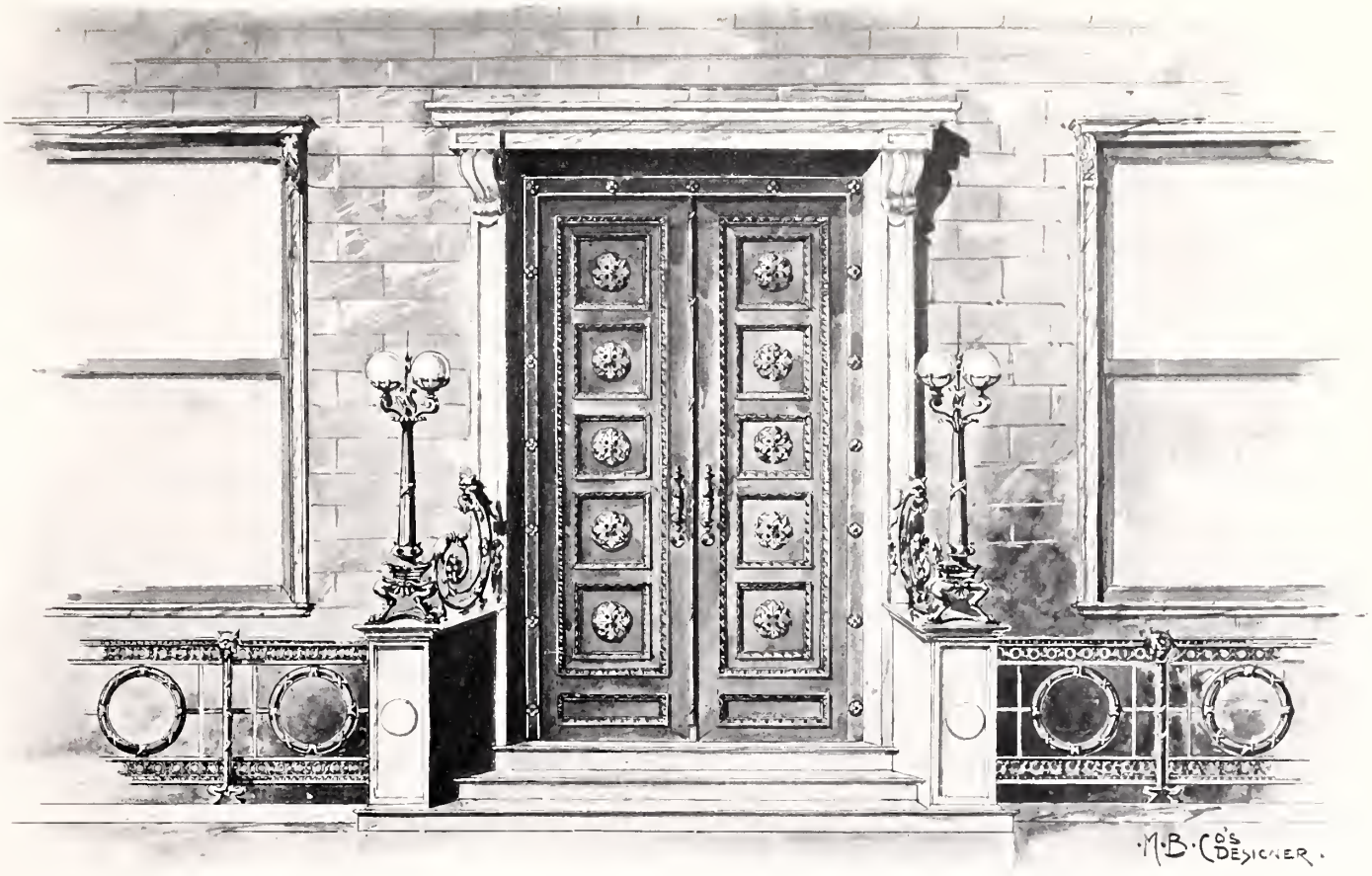
MANHATTAN BRASS COMPANY, N. Y.

BRONZE, as an architectural enrichment, gives results hardly obtainable at same cost in any other material. What is more distinctive; what could add more dignity and character to a building than a pair of massive bronze entrance doors? What architect would not gladly welcome the opportunity of specifying nothing but solid bronze for all visible metal work? By using improved means of manufacture, all the exposed door and window trim, sash, mullions, soffits, subcornices, etc., for a building, may be made of indestructible bronze for less than is often expended on perishable materials, and ornament which have less utility or architectural meaning.

We always esteem it a favor to have the privilege of answering any questions arising in the minds of architects or owners who contemplate the use of bronze work, and when requested, gladly furnish such details of construction or other information as, in our experience, may seem most applicable to the case.

STRENGTH AND HARDNESS OF COLD-ROLLED BRONZE COMPARED WITH THAT OF CAST BRONZE

Cold-rolled and drawn bronze is harder and stronger than cast bronze of like alloy, in about the proportion of 28 to 12. In other words, it has a resisting power of about 2½ times that of cast bronze of same weight and thickness.



BRONZE ENTRANCE DOORS, LANTERNS AND RAILINGS, NEW YORK APARTMENT HOUSE

MANHATTAN BRASS COMPANY, N. Y.

CASHIER'S STAND

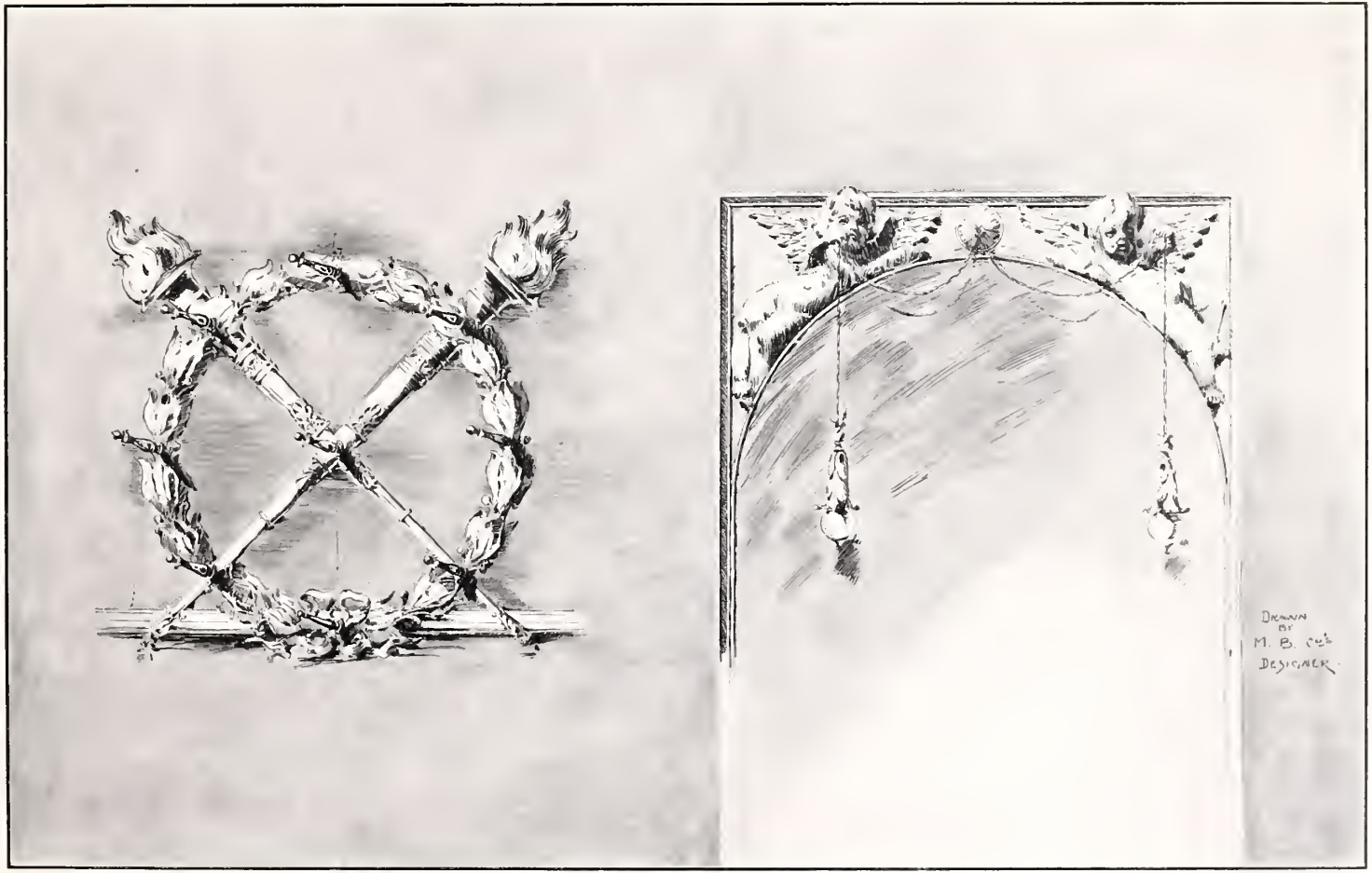
Designed and made by Manhattan Brass Company for Mr. Ellsworth Childs, 39 East 19th Street, New York

IN a decorative sense bronze and brass form the one, and, perhaps, the only class of materials that combine the qualities of entire permanence with richness of effect. They may be used tastefully to some extent in every room of every house that is built. If the designer will have recourse to the great variety of colors and finishes obtainable in these metals, he need be limited in extent of use only by the expensiveness of the structure under his consideration.

Table Showing in Decimals the SIZES AND WEIGHTS OF BRONZE AND BRASS TUBING, IRON PIPE SIZES. Made to correspond with iron tubes and to fit iron tube fittings.

Iron Pipe Sizes, in inches, as designated by the trade	¼ in.	⅜ in.	½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.	2½ in.	3 in.
Exact inside diameter, inches	.364	.494	.623	.824	1.048	1.38	1.611	2.067	2.468	3.07
Exact outside diameter, inches	.540	.675	.840	1.05	1.315	1.66	1.900	2.375	2.875	3.50
Diameter in fractional parts of an inch — Outside	9-16	11-16	13-16	1 1-16	1 5-16	1⅝	1⅞	2⅜	2⅞	3½
Diameter in fractional parts of an inch — Inside	23-64	½	⅝	53-64	1 3-64	1⅛	1 39-64	2 1-16	2 15-32	3 1-16
Thickness of Tubes in decimals of an inch	.088	.0905	.1085	.113	.134	.14	.1445	.154	.2035	.215
Approximate thickness of tubes by B. & S. standard gauge — No.	11	11	9½	9	7½	7	7	6½	4	7-32in
Weight per foot, in decimals of pounds — Bronze	.455	.655	.945	1.315	1.785	2.625	3.15	4.20	6.04	8.715
Weight per foot, in decimals of pounds — Brass	.43	.62	.92	1.25	1.70	2.50	3.	4.	5.75	8.30

MANHATTAN BRASS COMPANY, N. Y.



HAT AND COAT RACK

MIRROR FRAME

Designed and Made by Manhattan Brass Company, for Mr. Ellsworth Childs, 39 East 19th Street, New York

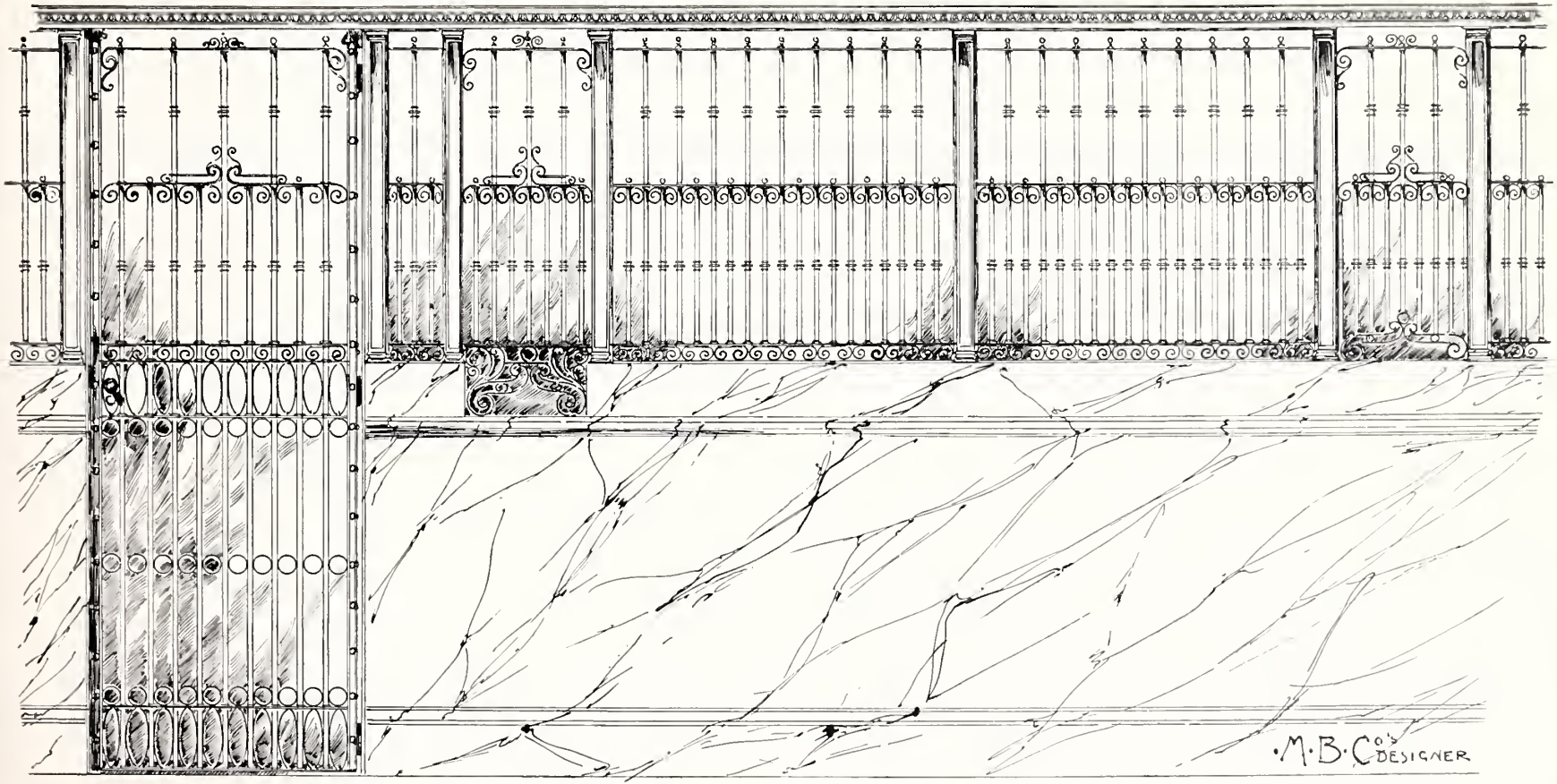
Approximate WEIGHTS OF ROUND TUBING in decimals of a pound per lineal foot, outside diameters and thickness as indicated.

Approx fractions of inch thick	$\frac{1}{64}$			$\frac{1}{32}$		$\frac{3}{64}$	$\frac{1}{16}$	$\frac{5}{64}$	$\frac{3}{32}$		$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$
Thickness by B. & S. Standard Guage	26	24	22	20	19	17	14	12	11	10	8	5	2
Thickness by decls.	.015	.0201	.0254	.032	.036	.0453	.064	.081	.091	.01	.128	.182	.258
Bronze	.079	.096	.107	.13	.15	.18	.24	.28	.31	.34			
Brass	.077	.092	.102	.126	.14	.17	.23	.27	.30	.32			
Bronze	.093	.117	.146	.18	.20	.25	.29	.35	.38	.41	.48		
Brass	.087	.111	.139	.17	.19	.24	.28	.33	.36	.31	.46		
Bronze	.105	.147	.185	.23	.25	.31	.44	.54	.59	.64	.78		
Brass	.112	.140	.174	.22	.24	.30	.42	.51	.56	.61	.74		
Bronze	.142	.177	.221	.27	.31	.39	.51	.65	.72	.80	.67	1.25	
Brass	.135	.167	.211	.26	.30	.37	.51	.62	.69	.76	.92	1.19	
Bronze	.178	.220	.269	.33	.37	.45	.63	.78	.86	.96	1.17	1.52	
Brass	.168	.198	.245	.31	.35	.43	.60	.74	.82	.91	1.11	1.45	
Bronze	.190	.236	.292	.36	.42	.52	.72	.90	1.	1.11	1.35	1.81	2.32
Brass	.181	.227	.282	.35	.40	.50	.69	.86	.95	1.06	1.29	1.72	2.21
Bronze	.237	.295	.367	.47	.52	.66	.92	1.14	1.27	1.42	1.74	2.35	3.10
Brass	.226	.283	.352	.45	.50	.63	.88	1.09	1.21	1.35	1.66	2.24	2.95
Bronze	.284	.354	.441	.52	.58	.72	1.02	1.27	1.41	1.57	1.94	2.62	3.49
Brass	.271	.339	.423	.50	.55	.69	.97	1.21	1.34	1.50	1.85	2.50	3.32
Bronze	.332	.413	.515	.57	.64	.80	1.11	1.39	1.54	1.72	2.13	2.91	3.87
Brass	.316	.396	.493	.54	.71	.76	1.06	1.32	1.47	1.64	2.03	2.77	3.69
Bronze	.379	.472	.588	.75	.75	.93	1.31	1.64	1.83	2.04	2.52	3.45	4.66
Brass	.361	.452	.563	.71	.71	.89	1.25	1.56	1.74	1.94	2.40	3.29	4.44
Bronze	.426	.531	.662	.85	.85	1.07	1.50	1.88	2.10	2.34	2.91	4.01	5.14
Brass	.406	.509	.634	.81	.81	1.02	1.43	1.79	2.00	2.23	2.77	3.82	5.18
Bronze	.474	.590	.736	.94	.97	1.22	1.70	2.12	2.37	2.66	3.31	4.56	6.22
Brass	.451	.566	.704	.90	.92	1.16	1.62	2.02	2.26	2.53	3.15	4.34	5.92
Bronze	.521	.649	.810	1.03	1.07	1.34	1.89	2.37	2.65	2.96	3.70	5.11	7.00
Brass	.497	.623	.775	.99	1.02	1.28	1.80	2.26	2.52	2.82	3.52	4.87	6.67
Bronze	.568	.708	.884	1.12	1.17	1.48	2.09	2.61	2.92	3.27	4.08	5.60	7.78
Brass	.542	.679	.845	1.07	1.12	1.41	1.99	2.49	2.78	3.11	3.89	5.39	7.41
Bronze	.663	.826	1.03	1.31	1.29	1.62	2.28	2.86	3.20	3.58	4.47	6.22	8.57
Brass	.632	.792	.986	1.25	1.23	1.54	2.17	2.72	3.05	3.41	4.26	5.92	8.16

The Art of Tempering Bronze

THE claim that the Egyptians tempered copper and bronze to carry a razor edge is not borne out by investigation. There is no piece of metal tempered by the ancients that cannot be more than duplicated to-day. An examination of hundreds of specimens, alleged to have been tempered to the degree that steel is tempered, fails to show any, and we know of no one who has seen such a work. Thus is the fable which has been believed for centuries, dissipated in the light of modern research.

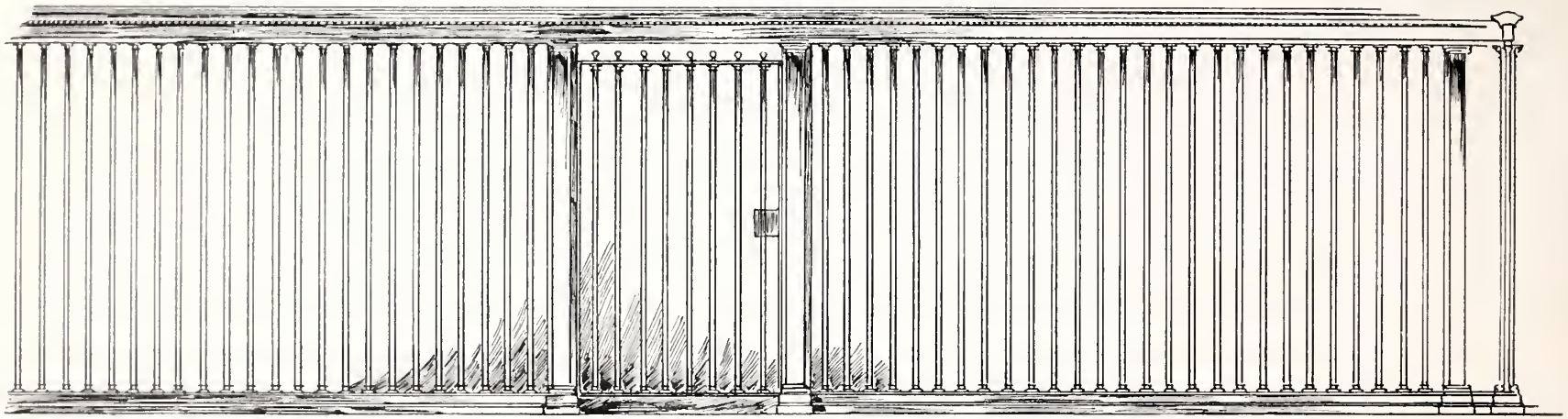
This is not the only story believed for centuries, tending to belittle the man of to-day, to make him the inferior of his forefathers, which fails under the search-light of inquiry and science. The ancients were children in mechanical knowledge as compared to the people of to-day, and if there were a demand for any particular building or piece of work such as was produced by the ancients, it could be duplicated and improved on by the skilled artisans of the nineteenth century.—Ex.



OFFICE RAILING AND DOOR

Designed by Manhattan Brass Company, for the Harlem Branch, International Banking and Trust Co.

MANHATTAN BRASS COMPANY, N. Y.



BANKING COUNTER RAILING

Designed and made by Manhattan Brass Company for the Standard Trust Company, 42 Wall Street, New York

Knowledge in Labor

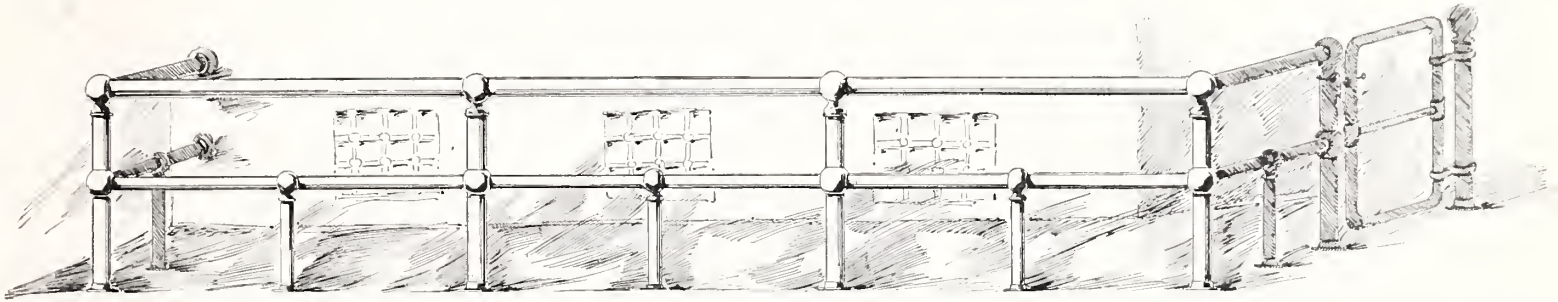
A SKILLED workman should always be thoroughly familiar with the raw material he is working or manipulating. He should know whether it is good or whether it is poor, also whether it is perfectly adapted to the particular article he may be producing, and how it should be handled to produce the best results. Inferior materials in the hands of a workman, who possesses the proper calculation in, or knowledge of, all the details of his particular branch of work, will produce better or more satisfactory results than the very best materials in the hands of one not possessing such knowledge. He should have sufficient knowledge covering the characteristics of the material he is handling and the proper method of working it, so that whenever anything goes wrong he can detect it instantly and be in a position to locate the trouble and apply the remedy.—*The Journal of Building*.

The soundness of this argument appeals to every one, and it is the basis of our strength as workers in bronze—the most complex of materials. We work no iron; we work nothing but bronze and brass. Our workmen make these metals a life study. We alloy and prepare the metals in our own works, and therefore are familiar with their every peculiarity, and know how to put into each job just the kind of metals and treatment that will produce the best results at a minimum of cost.

MAN. ATTA. BRASS COMPANY, N. Y.

WE ARE HEADQUARTERS

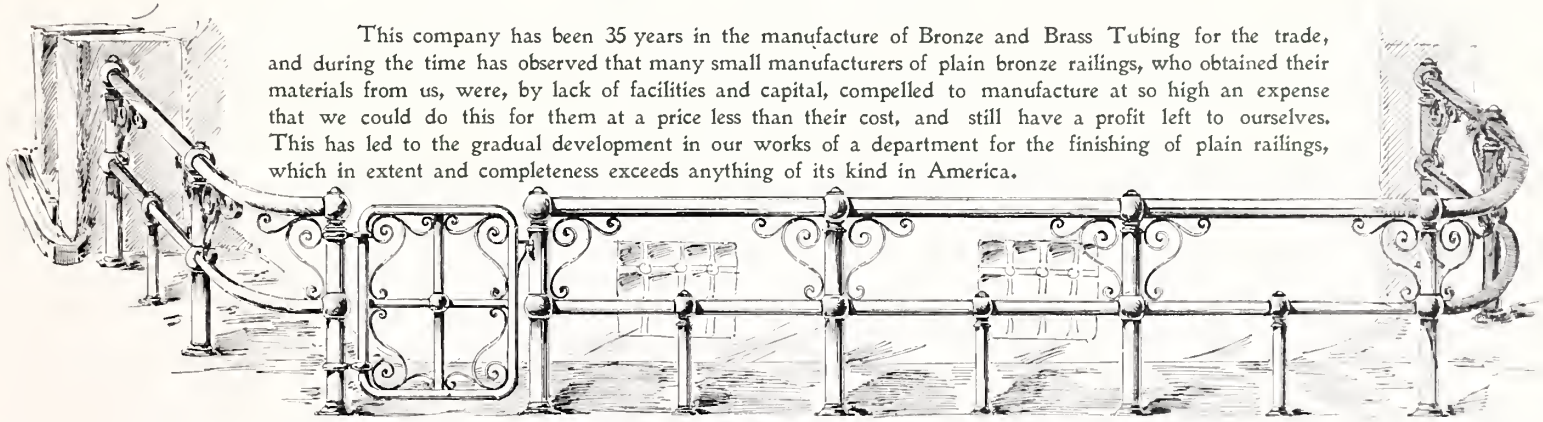
IF YOU DON'T GET OUR PRICE, YOU DON'T KNOW THAT YOU HAVE THE RIGHT PRICE



"BOULEVARD"

ABOUT PLAIN RAILINGS

This company has been 35 years in the manufacture of Bronze and Brass Tubing for the trade, and during the time has observed that many small manufacturers of plain bronze railings, who obtained their materials from us, were, by lack of facilities and capital, compelled to manufacture at so high an expense that we could do this for them at a price less than their cost, and still have a profit left to ourselves. This has led to the gradual development in our works of a department for the finishing of plain railings, which in extent and completeness exceeds anything of its kind in America.



"WEST PARK"

DRAWN BY M. B. Co's DESIGNER

TUBE WORKS, ROLLING MILL AND FOUNDRY

First Avenue, 27th and 28th Streets
New York City

AS TO THE BENDING OF TUBES

Usually a bronze or brass tube can be bent to any radius larger than three times its own diameter. Angles and corners smaller than this should be made of castings from special models.

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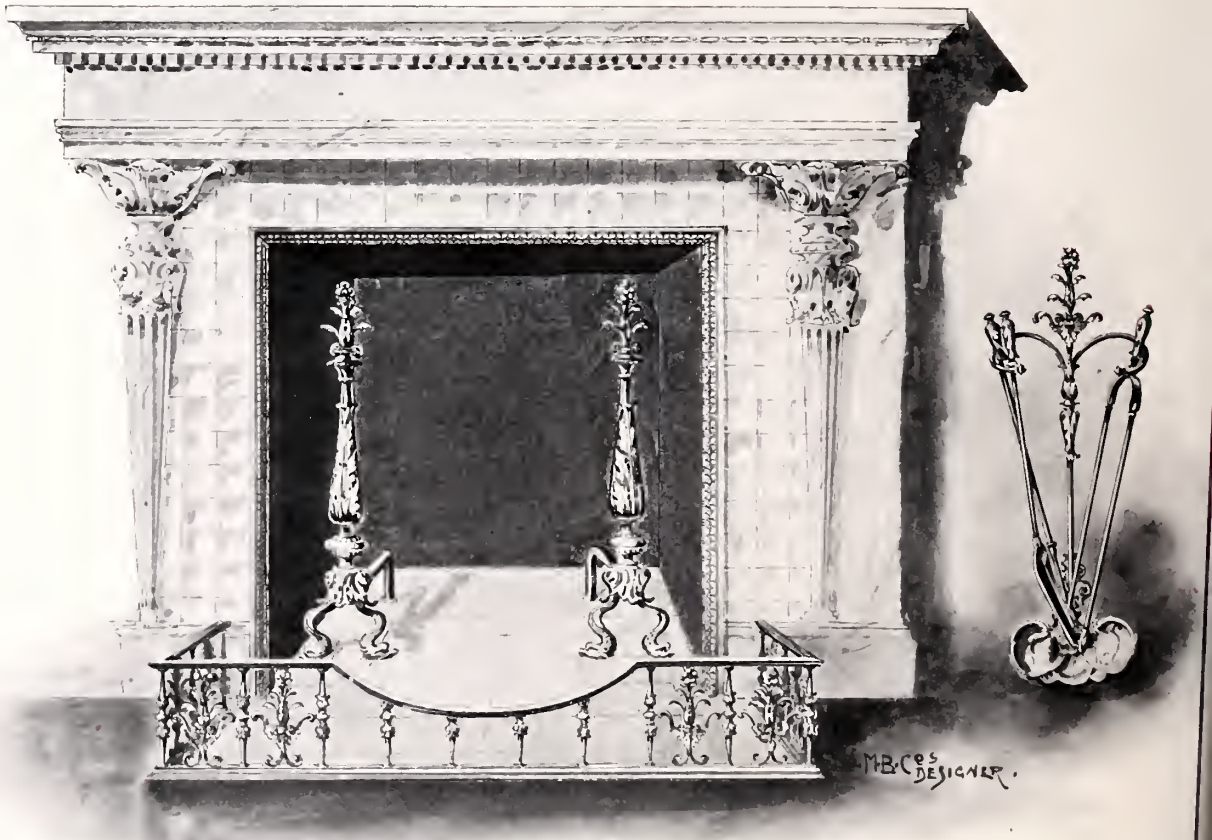
We make a large line of Brass Fireplace Goods. If your dealer does not carry them, write us for catalogue, or send us your own special designs for estimate.

Why are our common things — the things with which we live, with which we pass our lives—which are of infinitely greater importance to our education than even the masterpieces which we see occasionally for a few hours or minutes in our great picture galleries—why are these things so inferior and so inartistic? —*Hon. Joseph Chamberlain.*

If one of the busiest men in the world thinks the aesthetic situation grave enough to distract him for a few moments from his official duties, it is time for people of more leisure to see if his plaint is not well-founded. There is much hideous furniture within more or less hideous houses, and there are hideous statues without. —*N. Y. Press.*



Ruskin, in his "Political Economy of Art," advances the argument that artistic objects are a part of the national wealth, and that the government should protect those in existence from destruction and should promote their increase; instructing and directing its manufacturers along artistic lines, by the establishment in each community of some sort of art censorship. Articles of artistic design cost no more to make than if ugly. This applies with special force to such as are illustrated on this page. Fireplace brasses are objects of both utility and art. They last generations, and if artistic are handed down as heirlooms, increasing in value with every passing decade.

Manhattan Brass Company

NEW YORK